

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A plasma surface processing system for processing a surface of a metal material by forming plasma in a reaction, comprising:

~~the system comprising~~ a supply device configured to supply a for-plasma processing solution which supplies a processing material which forms plasma into the reaction chamber as a liquid drop form in order to process the surface of the metal material, the supply device including

a processing solution reservoir configured to store the plasma processing solution as a hermetic state;

a carrier gas inflow pipe connected to the processing solution reservoir and configured to introduce a carrier gas, which carries liquid drops of the plasma processing solution, into the processing solution reservoir;

a supply pipe connecting the processing solution reservoir to the reaction chamber and configured to supply the carrier gas and the liquid drops of the plasma processing solution to the reaction chamber; and

a temperature control device provided with the processing solution reservoir and configured to control a temperature of the stored plasma processing solution, wherein the temperature control device includes:

a receiving tank configured to hold the processing solution reservoir and insulating oil,

a heater installed in the receiving tank, and

a cooling device installed in the receiving tank.

2. (Cancelled)

3. (Currently Amended) The system of ~~claim 2~~claim 1, wherein the carrier gas inflow pipe is installed under a state of being soaked in the processing solution stored in the reservoir, and has a plurality of discharge holes for forming processing solution foam by the carrier gas discharged from the inflow pipe.

4. (Original) The system of claim 3, wherein an end portion of the carrier gas inflow pipe has a ring shape where the plurality of discharge holes are formed.

5. (Previously Presented) The system of claim 3, wherein the carrier gas inflow pipe is provided with a gas amount controller for controlling amount of carrier gas.

6. (Currently Amended) The system of ~~claim 2~~claim 1, wherein the carrier gas inflow pipe is provided with a gas amount controller for controlling amount of carrier gas.

7. (Previously Presented) The system of claim 3, wherein the carrier gas inflow pipe is further provided with a separation pipe connected to the reaction chamber in order to introduce the carrier gas into the reaction chamber.

8. (Original) The system of claim 7, wherein gas flow control valves are respectively installed at the separation pipe and between a connection spot of the inflow pipe and the separation pipe and the reservoir.

9. (Original) The system of claim 7, wherein the separation pipe is connected to the supply pipe.

10. (Currently Amended) The system of ~~claim 2~~claim 1, wherein the carrier gas inflow pipe is further provided with a separation pipe connected to the reaction chamber in order to introduce the carrier gas into the reaction chamber.

11. (Currently Amended) The system of ~~claim 2~~claim 1, wherein the supply pipe is further provided with a gas amount controller for controlling amount of the carrier gas including liquid drops of the processing solution.

12. (Original) The system of claim 11, wherein a pair of valves for controlling flow of the carrier gas are installed at the supply pipe up and down on the basis of the gas amount controller.

13-14. (Cancelled)

15. (Currently Amended) The system of ~~claim 2~~claim 1, wherein the supply pipe is further provided with a heater for increasing temperature of the carrier gas including liquid drops of the processing solution.

16. (Original) The system of claim 1, wherein the surface of the metal material is consecutively processed.

17. (Original) The system of claim 1, wherein the metal material is an electrode.

18. (Original) The system of claim 1, wherein the processing solution is hexamethyldisilazane (HDMS) or hexamethyldisiloxane (HDMSO).

19. (Original) The system of claim 1, wherein the carrier gas is N₂ or He.

20. (Previously Presented) The system of claim 1, wherein the reservoir further comprises a processing solution supplementary device for supplementing plasma processing solution thereinto.

21. (Original) The system of claim 20, wherein the processing solution supplementary device comprises:

a first supplementary pipe connected to the reservoir;

a storage container in which processing solution is stored;

a second supplementary pipe connected to the storage container;
a connecting unit for connecting the first supplementary pipe and the second supplementary pipe; and
valves respectively installed at the first and second supplementary pipes.

22. (Currently Amended) In a plasma surface processing system for processing a surface of a metal material by forming plasma in a reaction chamber,

~~a supply device for plasma processing solution which supplies a processing material which forms plasma into the reaction chamber as a liquid drop form in order to process the surface of the metal material.~~ a supply device configured to supply a plasma processing solution into the reaction chamber in a liquid drop form, the supply device comprising:

a processing solution reservoir configured to store the plasma processing solution as a hermetic state;

a carrier gas inflow pipe connected to the processing solution reservoir and configured to introduce a carrier gas, which carries liquid drops of the plasma processing solution, into the processing solution reservoir;

a supply pipe connecting the processing solution reservoir to the reaction chamber and configured to supply the carrier gas and the liquid drops of the plasma processing solution to the reaction chamber; and

a temperature control device provided with the processing solution reservoir and configured to control a temperature of the stored plasma processing solution, wherein the temperature control device includes:

a receiving tank configured to hold the processing solution reservoir and insulating oil,

a heater installed in the receiving tank, and

a cooling device installed in the receiving tank.